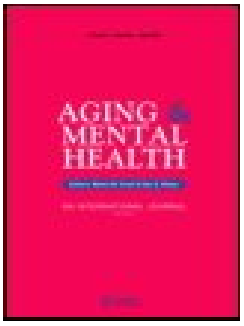

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Prevalence of hypotension and its association with cognitive function among older adults

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ABSTRACT

Background and Objective: The negative effect of hypertension has overshadowed possible health problems associated with hypotension. The purposes of this study were to describe the prevalence of hypotension in older adults and to determine the association between hypotension and cognitive function, after adjusting for possible covariates.

Methodology: The data for the study consisting of 1067 community-dwelling older adults were obtained from a national survey entitled "Identifying Psychosocial and Identifying Economic Risk Factor of Cognitive Impairment among Elderly", conducted in Malaysia. The hypotension was considered as blood pressure 120/75 mm Hg, measuring by standard mercury manometer. Data analysis was performed using the SPSS Version 22.0.

Results: The mean age of the respondents was 68.27 (SD = 5.93). Mean score of cognitive function as measured by MMSE was 22.70 (SD = 4.95). The prevalence of hypotension was 29.3%. The prevalence of cognitive impairment for hypotension group was 25.6%. Results of multiple linear regression analysis revealed that hypotension is negatively associated with cognitive function (Beta = −0.11, *p* .01), after adjusting for age, gender, education, marital status, employment status, diabetes, heart disease, stroke and gastritis.

Conclusion: The study showing hypotension is significantly associated with decreased cognitive function in later life, implies more attention to low blood pressure in old age.

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Aged; cognition; hypotension

Introduction

Scientific investigation on blood pressure has mostly focused on hypertension. The potential negative effect of hypertension as a leading risk factor for disability and mortality has overshadowed the possible health problems related to hypotension. Through decades, hypotension has been viewed as an ideal blood pressure level and as an example of a nondisease (Hildrum et al., 2007). Given the importance of cognitive abilities in old age, many studies have investigated the effect of hypertension on cognitive function and found that hypertension significantly contributes to cognitive function in old age (Hamid, Krishnaswamy, Abdullah, & Momtaz, 2010; Yang, Roe, & Morris, 2011; Zou et al., 2014). Several mechanisms such as atherosclerotic mechanism and hemodynamic mechanism have been proposed to explain the association between hypertension and cognitive impairment in old age. According to atherosclerotic mechanism, hypertension can cause severe atherosclerosis and large-artery stiffness in old age, which may contribute to cognitive impairment. Moreover, hypertension as a major risk factor for stroke and white matter lesions can promote clinical manifestations of cognitive dysfunction (Qiu, Winblad, & Fratiglioni, 2005). Another process that may be involved in the pathogenesis, progression, and clinical presentation of dementia is hemodynamic mechanism. Severe atherosclerosis can induce several conditions such as cerebral hypoperfusion, ischemia, and hypoxia which may sequentially destabilize neurons and synapses. Thus, the poor cerebral perfusion may initiate or promote neurodegeneration in the aging brain and promote cognitive impairment (Qiu et al., 2005).

Since the brain might be more vulnerable to ischemic insults when systemic blood pressure dips below a critical threshold for maintaining cerebral perfusion (Guo, Viitanen, Fratiglioni, & Winblad, 1996; Kennelly, Lawlor, & Kenny, 2009), hypotension may also adversely affect cognitive function. However, the problem has been generally neglected and relatively little attention has been ascribed to hypotension in clinical and research literature. Because of the lower mortality rate, clinicians often neglect people with hypotension and consider it as a nondisease, in spite of its association with considerable morbidity at the community level (Robbins, Korda, & Shapiro, 1982). One reason for this comes from the current doctrine that hypotension is compensated by autoregulatory processes which prevent reduced cerebral perfusion (Duschek & Schandry, 2007). Although a number of studies have provided strong evidence for the association between hypotension with syncope, falls, stroke, personal well-being, and quality of life (Aronow & Ahn, 1997; Klein et al., 2013; Rosengren, Tibblin, & Wilhelmsen, 1993; Wessely, Nickson, & Cox, 1990), there is limited knowledge on the extent to which hypotension is associated with cognitive function in old age and existing studies are inconsistent (Viramo et al., 1999). Rose et al. (2006), in their study entitled 'Atherosclerosis Risk In Communities (ARIC)', assessed the impact of hypotension on cognitive function on a cohort of 12,702 participants over 12 years of follow-up. Although the findings revealed an

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